AN INTRODUCTION TO THE EVOLUTION AND TAXONOMY OF THE SARCOPHAGINAE (DIPTERA, SARCOPHAGIDAE)

BY

SELWYN S. ROBACK

B.S., Cornell University, 1948
M.S., University of Illinois, 1949

AN ABSTRACT OF A THESIS

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF DOCTOR OF PHILOSOPHY IN ENTOMOLOGY
IN THE GRADUATE COLLEGE OF THE
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AN INTRODUCTION TO THE EVOLUTION AND TAXONOMY OF THE SARCOPHAGINAE (DIPTERA, SARCOPHAGIDAE)

The delineation of the genera within the subfamily Sarcophaginae, of the Sarcophagidae or flesh-flies, has always been a major problem to muscoid taxonomists. There has been great fluctuation in the number and size of the genera included in the Sarcophaginae with each classification proposed, such as those of Aldrich (1916), Enderlein (1928), Rohdendorf (1937), Townsend (1935-38), and Hardy (1943). Over 175 different generic names have been proposed within the Sarcophaginae by these and other authors. Many of these genera have been poorly defined or based on characters of dubious value.

This work is an attempt to determine the phylogeny of the species of Sarcophaginae and to provide a sound basis for the generic classification of the subfamily.

Toward this end, 145 species of Sarcophaginae were studied. The aedeagi of all these species were dissected and drawn, and all the parts homologized. In addition to the species studied, 345 species were placed in the genera proposed, on the basis of good descriptions and figures in the literature.

The parts of the aedeagus were found to be most useful in working out the phylogeny and taxonomy of the Sarcophaginae. External characters, such as the bare or villous hind tibia and chaetotaxy, did in some cases show direction of evolution but in general were of little use in this study.

On the basis of this study the following classification of the Sarcophaginae is proposed:

Subfamily Sarcophaginae

Tribe Agriini

Subtribe Wohlfahrtiina
Genus *Wohlfahrtia*

Subtribe Sarcofahrtiina
Genus *Sarcofahrtia*

Subtribe Agriina
Genus *Agria*

Tribe Sarcophagini

Series I

Subtribe Impariina
Genus *Imparia*

Series II

Subtribe Hypopeltina
Genus *Hypopelta*

Subtribe Sarcophagulina
Genus *Sarcophagula*

Subtribe Sarcophagina

Johnsonia Group
Genera: *Camptops, Chloronesia, Argoravinia, Johnsonia, Helicobia.*

Sarcophaga Group
Genera: *Sarcomyia, Arachnidomyia, Sarcophaga, Sapromyia, Wohlfahrtiopsis.*

Subtribe Raviniina
Genera: *Cistudinomyia, Ravinia, Oxysarcodexia.*

Subtribe Hystricocnemina
Genus *Hystricocnema*

Series III

Subtribe Sarcodexiina
Genera: *Sarcodexia, Paraphrissopoda, Euboettcheria.*

Subtribe Boettcheriina
Genera: *Rafaelia, Boettcheria, Metoposarcophaga, Aphelomyia, Tylomyia, Cucullomyia, Kellymyia, Spirobolomyia.*

Subtribe Servaisiina

Genera: *Servaisia, Fletcherimyia, Acandotheca, Kurtomyia.*

Important Phylogenetic and Taxonomic Conclusions

1. On thebasis of evidence offered by the aedeagus, all three Series arose from the ancestors of the more primitive subfamily of the Anthomyiidae, the Scopeumatinae. Each Series represents a different line of development of the aedeagus.

2. The subtribes represent the major phyletic lines within the Series and the genera represent the major phyletic lines within the subtribes.

3. Parallel development of phallic structures between and within the phyletic lines is characteristic of the Sarcophagini.

4. The three Series have such a combination of generalized and specialized characters that it is only possible to indicate their points of origin in the light of present knowledge. The same is true of the subtribes of Series 3.

5. On the basis of phallic structure, the Sarcophagulina and the *Johnsonia* Group contain the most primitive members of Series 2.

6. The asymmetrical phallus of *Imparia impar* (Ald.) is believed to merit subtribal rank for the genus.

7. The genotypes of *Sarcophagula* Van der Wulp 1887 and *Sarothromyia* Brauer & Bergenstamm 1891 are considered to be congeneric.

8. The genotypes of the genera *Camptops* Aldrich 1916 and *Harpagopyga* Aldrich 1916 are considered to be congeneric. *Camptops* is selected as the resultant generic name.

9. The genotypes of the genera *Chloronesia* Townsend 1912 and *Notochaeta* Aldrich 1916 are considered to be congeneric.

10. The genus *Argoravinia* Townsend 1917 is placed in the *Johnsonia* Group, close to the genus *Chloronesia*, on the basis of the structure of its phallus.

11. The genotypes of the genera *Johnsonia* Coquillet 1895, *Sthenopyga* Aldrich 1916 and *Emblemasoma* Aldrich 1916 are considered to be congeneric. The resultant genus *Johnsonia* is divided into the subgenera *Emblemasoma* and *Johnsonia* (= *Johnsonia* + *Sthenopyga*).

12. The genus *Sarcophaga* is considered as a large world-wide genus. On the basis of present knowledge it is impossible to divide it into subgenera and species complexes.

13. The genotypes of the genera *Metoposarcophaga* Townsend 1917 and *Zygastropyga* Townsend 1917 are considered to be congeneric and each is placed as a subgenus of the genus *Metoposarcophaga*. The genotype of *Sabinata* Parker 1921 is considered congeneric with that of the subgenus *Zygastropyga*.

14. The genotypes of *Fletcherimyia* Townsend 1917 and *Peltopyga* Townsend 1917 are considered to be congeneric with *Fletcherimyia* selected as the resultant generic name.

15. The genotypes of the genera *Acridophaga* Townsend 1917, *Protodexia* Townsend 1912, and *Servaisia* Robineau-Desvoidy 1863 are considered to be congeneric. Each is considered as a subgenus of *Servaisia* and two new subgenera, *Sarpedia* and *Speciosia* are proposed.

16. The genotypes of the genera *Acandotheca* Townsend 1917, *Eleodiomyia* Townsend 1917, *Sarcophodexia* Townsend 1917, *Notochaetopsis* Townsend 1917, *Stenolaucotheca* Townsend 1918, and *Tephromyiella* Townsend 1917 are considered to be congeneric. *Acandotheca* is chosen as the generic name.

17. The genus *Acandotheca* consists of the subgenera *Acandotheca Stenolaucotheca, Tephromyiella*, and two new subgenera, *Lepyria* and *Mecynocorpus*.

18. On the basis of the phallus, the genus *Xenoppia* Townsend 1915 is removed from the Sarcophaginae and placed in

the Miltogramminae.

19. The following new genera and subgenera are proposed:
Genus *Imparia*
Genus *Sarcomyia*
Genus *Sapromyia*
Genus *Aphelomyia*
Genus *Cucullomyia*
Genus *Tylomyia*
Genus *Kurtomyia*
Subgenus *Sarpedia*
Subgenus *Speciosia*
Subgenus *Lepyria*
Subgenus *Mecynocorpus*

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VITA

Selwyn S. Roback was born at Boston, Massachusetts, August 22, 1924. After two and one-half years of study at the College of the City of New York, he enlisted in the United States Army and served in the American and Mediterranean Theaters. Upon discharge from the Army in 1946 he entered Cornell University, receiving his Bachelor of Science degree in 1948. While at Cornell he was elected to Phi Kappa Phi. He then entered the University of Illinois for graduate Work, receiving his Master of Science degree in Entomology in 1949. While at the University of Illinois he has been elected to Sigma Xi and Phi Sigma, and has held second and third year University Fellowships.

In September of 1949 he married Miss Helen Marie Handy of Pleasantville, Pennsylvania.